

corvus
CORPORATION
DALLAS, TEXAS

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corvus ⁴¹⁵ PORTABLE
BUSINESS CALCULATOR
WITH MEMORY



OWNERS MANUAL

INDEX

FEATURES	3
INTRODUCTION	4
A NOTE ABOUT CORVUS	4
OPERATION KEYS	5-6
DISPLAY SYMBOLS	6
SPECIAL FEATURES	
Floating Decimal	7
Automatic Constant	7
POWERS	7
CLEAR KEY	8
MEMORY	9
SAMPLE CALCULATIONS	
Standard problems	10
Reciprocal	11
Mixed or Chain calculations	11
Automatic Constants	11-12
Exchange	13
Factorial	13
MEMORY OPERATIONS	13-20
Metric Conversions	19
Temperature Conversions	20
MAINTAINING CALCULATOR	21
SERVICE CERTIFICATE	23

CORVUS 415 FEATURES

- ✓ Accumulating memory with single-key command: M Recall, M Clear, M Add, and M Subtract
- ✓ Seven calculation functions including single-key Percentage, Reciprocal and Exchange plus add, subtract, multiply and divide
- ✓ Unique Exchange key (EX) automatically changes multiplicands to multipliers, and dividends to divisors
- ✓ Automatic chain constant that can always be entered as the second number, in five functions.
- ✓ Bright eight-digit display shows floating negative sign, calculation overflow, memory storage indication. Designed for desk-top or hand-held operation
- ✓ Full floating decimal
- ✓ Twelve hours continuous operation on fully charged Nickel Cadmium batteries, or direct for AC outlet using Adapter
- ✓ AC Adaptor/Charger included, UL and CSA listed
- ✓ Positive touch keyboard designed for easy key selection



INTRODUCTION

Your new Corvus 415 business calculator was designed to provide you with many years of time-saving calculation capability. The full memory with single-key entry enables you to perform two independent calculations simultaneously—twice the calculating power normally found in non-memory units.

Packed with calculating power the 415 gives you the standard four functions, single-key entry for Percentage (%) and Reciprocal ($1/X$), plus an Exchange key (EX) which automatically changes multiplicands to multipliers and dividends to divisors.

Other features include constant, full floating decimal, simple algebraic entry and a bright, eight digit, LED display.

A NOTE ABOUT CORVUS

Each calculator in the CORVUS line features a MOS/LSI integrated circuit manufactured by MOSTEK Corporation. MOSTEK, the parent company of Corvus, was first in the world to introduce the single-chip calculator integrated circuit in 1970. Contained in an area less than $\frac{1}{4}$ of an inch square, this first MOSTEK "chip" provided the complete capability of a four-function calculator. This breakthrough virtually revolutionized the calculator industry by making possible compact design and portable operation of handheld units. A similar, more advanced MOS integrated circuit found in the 415 provides you with a powerful memory and extra-calculation functions.

Each Corvus calculator is designed to provide extra capability to solve a wide variety of calculation applications found in the home, business, office and the field. Corvus built-in reliability is backed by a full year warranty on components and service.

OPERATION KEYS

+

Instructs the calculator to add the displayed number to the next numeric entry. During chain calculations it will simultaneously complete any previous calculation.

-

Instructs the calculator to subtract the **next** entry from the displayed number. During chain calculations it will simultaneously complete any previous calculation.

×

Instructs the calculator to multiply the displayed number by the **next** numeric entry. During chain calculations it will simultaneously complete any previous calculation.

÷

Instructs the calculator to divide the displayed number by the **next** numeric entry. During chain calculations it will simultaneously complete any previous calculation.

%

Instructs the calculator to automatically multiply a number by $1/100$, resulting in a percentage. Note that this key will only work after entering a number from the keyboard. (i.e. cannot use % after (+, -, ×, ÷, =, or RM).

=

Instructs the calculator to complete all previous calculations and display the answer. It is the operative key when calculating with constants. See pages 11-12 for examples of calculations.

M+

Instructs the calculator to add the displayed number to the contents of memory only.




M-


Instructs the calculator to subtract the displayed number from the contents of memory only.

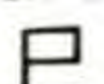

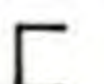
- RM** Instructs the calculator to RECALL the contents of memory and display the number.
- CM** Instructs the calculator to turn off the "memory in use" indicator and reset (to 0) the memory. The display is not affected by this key.
- EX** Instructs the calculator to interchange the operands of the function previously entered (i.e. $6 \div 3$, **EX** becomes $3 \div 6$). See page 13 for an example.
- 1/X** Instructs the calculator to divide the displayed number into 1. Note that this key **does not** complete any previous calculation.

NUMERIC AND SYMBOLIC DISPLAYS

Your calculator displays up to 8 digits with the decimal point in any of 8 places. A ninth (leftmost) position is used to display a calculation OVERFLOW (positive or negative) condition, a MEMORY in USE indication or a negative sign.

-  This symbol indicates a calculation was attempted which resulted in a positive OVERFLOW or answer exceeding the calculator's capacity. Clear by depressing **C**.
-  This symbol indicates a calculation was attempted which resulted in a negative OVERFLOW or answer exceeding the calculator's capacity. Clear by depressing **C**.
-  This symbol indicates that the memory is "in use"; that is, a number has been stored in the memory. The memory may be cleared by depressing **CM**. Display is not affected.

-  This symbol indicates a negative number. Symbol "floats," i.e., appears to the immediate left of the negative number.

NOTE: Combinations of these symbols can occur and are valid (i.e., , , ).



FLOATING DECIMAL

Your calculator is equipped with full floating decimal capabilities and will carry results of calculations to the maximum number of places (decimal points) required by the answer, within the 8-digit capacity. It does not round off fractions to the nearest number, but rather truncates them. For example, $100 \div 6$ would display 16.666666 rather than 16.666667.

AUTOMATIC CONSTANT

An automatic built-in constant allows you to use a constant factor in addition, subtraction, multiplication, division, and percentage calculations. The **second** entry (in all cases) will be the constant factor. (See Pages 11-12).

POWERS

Powers of whole numbers may be obtained by entering the number, depressing the **X** key, and then the  key. The calculator will now display the square or second power of the number entered. Successive powers are obtained by continuing to depress the  key. The exponent may be a positive or negative whole number.

CLEAR KEY

C

- This key serves a dual purpose, either as a CLEAR ENTRY or a CLEAR function.
- When depressed after any operational key **C** clears the display and "erases" previous operational instructions. Display returns to "0." (or to "L 0." if any quantity remains in memory.)
- The clear key can also "erase" incorrectly entered numbers, if pressed before striking an operational key without interrupting chain calculations. Display returns to "0." (or "L 0." if any quantity remains in memory.)

USE OF C KEY

	ENTER	DISPLAY
	C	0.
Incorrect entry in	3	3.
problem such as	×	3.
$3 \times 4 + 3$	4	4.
	+	12.
(Wrong Entry!)	6	6.
	C	0.
(Correct entry is accepted;	3	3.
chain not affected.)	=	15.

NOTE: To insure calculator clearance, i.e., there are no contents in memory and no calculation in process, clear calculator in this sequence:

CM, C (or C, CM)

Display should then read "0".

- OFF Turning the calculator to OFF completely clears it of all entries, instructions and memory contents.

SIMPLICITY OF ENTRY

Note that entering problems is very easy. You simply enter the problem in the same order as you would write it; for example, $4 - 2 =$

MEMORY USE

The memory has the same capacity as the calculator (i.e., 8 digits and one symbol) and is completely independent of the calculator operation.

The functions available are:

- 1) Memory Add (M+) The number displayed is added to the memory contents.
- 2) Memory Subtract (M-) The number displayed is subtracted from memory contents.
- 3) Recall Memory (RM) — This key can be used at any time to recall and display the contents of the memory. This feature provides a greater versatility of calculations. The memory contents can be recalled and used in any subsequent calculations, (e.g., a dividend in division) without changing the memory content. The results of such calculations can then be added to or subtracted from the original memory contents. Or a new result may be used to replace the previous memory contents.
- 4) Clear Memory (CM) — Contents of the memory are cleared. This action will remove the memory symbol "L" from the display. It will not affect any calculation in process or any number displayed. If the memory contents are on display, these figures will remain. Depress **C** to return display to (0).

SAMPLE CALCULATIONS

	ENTER	PRESS	DISPLAY
STANDARD PROBLEMS		C	0.
ADDITION		+	73.5
73.50 + 5.14 =	5.14	=	78.64

Not necessary to enter insignificant zeros

SUBTRACTION		C	0.
56.0 - 21.37 =	56	-	56.
Illustrates full floating decimal capability	21.37	=	34.63

MULTIPLICATION		C	0.
(1) 704.5 × 6.2 =	704.5	×	704.5
Insignificant zeros in result not displayed	6.2	=	4367.9

(2) 5.5 × (-7.2) =		C	0.
	5.5	×	5.5
		-	5.5
	7.2	=	-39.6

DIVISION		C	0.
(1) 100 ÷ 6 =	100	÷	100.
Truncation — full floating decimal	6	=	16.666666

(2) 100 ÷ (-) 6 =		C	0.
	100	÷	100.
		-	100.
	6	=	-16.666666

(3) -100 ÷ 6		C	0.
		-	0.
	100	÷	-100.
	6	=	-16.666666

	ENTER	PRESS	DISPLAY
RECIPROCAL		C	0.
(1) 1/5 or 1 ÷ 5 =	5	1/×	0.2
(2)		C	0
$\frac{1}{2.5 \times 6} =$	2.5	×	2.5
	6	=	15.
		1/×	0.0666666

MIXED OR CHAIN CALCULATIONS		C	0.
	1.5	×	1.5
	4	+	6.
(1.5 × 4) + 3	3	÷	9.
6	6	-	1.5
	7.4	=	-5.9

AUTOMATIC CONSTANT FUNCTIONS		C	0.
	125	+	125.
	25	=	150.
(1) Addend: Enter constant number last	250	=	275.
	212	=	237.

$$\begin{array}{r} 125 \quad 250 \quad 212 \\ +25 \quad +25 \quad +25 \end{array}$$

(2)		C	0.
	25	-	25.
	-10	=	15.
	36	=	26.
	80	=	70.

	ENTER	PRESS	DISPLAY
(3) Subtrahend: Enter minuend first, constant number next		C	0.
	125	—	125.
	25	=	100.
125 250	250	=	225.
<u>-25</u> <u>-25</u>			
(4) Multiplier: Enter constant number as second initial entry		C	0.
100 × 2.5 =	100	×	100.
125 × 2.5 =	2.5	=	250.
(205 × 2.5) × 3 =	125	=	312.5
	205	=	512.5
✕ key updates constant factor	3	×	512.5
		=	1537.5
Divisor		C	0.
(5) $\frac{6}{3}$ $\frac{156}{3}$ $\frac{918}{3}$	6	÷	6.
	3	=	2.
	156	=	52.
	918	=	306.
Constant dividend: See page 17			
Percentage Rate		C	0.
(6) 20% of 150	150	×	150.
20% of 200	20	%	30.
20% of 300	200	=	40.
Enter constant number second in initial entry	300	=	60.
Percentage Base		C	0.
(7) 10% of 200 =	10	%	0.10
15% of 200 =		×	0.10
40% of 200 =	200	=	20.
Enter constant number second in initial entry	15	%	30.
	40	%	80.

	ENTER	PRESS	DISPLAY
EXCHANGE			
This key is extremely useful when it is desired to divide a calculation result into the contents of memory.			
72×4	72	C CM	0.
	4	×	72.
		=	288.
$13 \div 8.5$	13	M +	288.
	8.5	÷	13.
		=	21.5
(Equation = 21.5 ÷ 288)		÷	21.5
(Equation Now = 288 ÷ 21.5)		RM	288.
		EX	21.5
		=	L 13.395348
DIFFERENCE OF PRODUCTS			
(12 × 32) - (8 × 16) = ?	12	C CM	0.
	32	×	12.
		=	384.
	8	M +	384.
	16	×	8.
		=	128.
		M -	128.
		RM	256
n = Factorial:			
6!		C CM	0.
	1	×	1.
	2	×	2.
	3	×	6.
	4	×	24.
	5	×	120.
Result = Factorial 6	6	=	720.
UNIT PRICING			
Compare 50 oz. @ .79 or 75 oz. @ 1.14 (Cost per oz.)	.79	C CM	0.
	50	÷	0.79
		=	0.0158
		C	0.
	1.14	÷	1.14
(Cost per oz.)	75	=	0.0152

OPERATIONS IN MEMORY

	ENTER	PRESS	DISPLAY
ADDING IN MEMORY			
Store the total of		C CM	0.
54 + 32 + 64 + 98	54	M +	L 54.
	32	M +	L 32.
	64	M +	L 64.
	98	M +	L 98.
(Recalls total)		RM	L 248.

SUBTRACTING IN MEMORY (ONLY)

Store: 154 - 35		C CM	0.
	154	M +	L 154.
	35	M -	L 35.
		RM	L 119.

GRADING STUDENTS

		C CM	0.
	60	+	60.
Semester grade:	75	+	135.
75% of average interim	75	+	210.
grades + 25% of	70	÷	280.
final exam	4	=	70.
Interim grades:		×	70.
60, 75, 75, 70	75	%	52.5
		M +	L 52.5
Final exam: 90	90	×	L 90.
	25	%	L 22.5
		+	L 22.5
		RM	L 52.5
= Semester Grade		=	L 75.

	ENTER	PRESS	DISPLAY
CUMULATIVE PRODUCTS			
(e.g., Inventory)		C CM	0.
15 @ 39¢	15	×	L 15.
25 @ 1.09	.39	=	L 5.85
32 @ 42.50		M +	L 5.85
10 @ 16.25		C	L 0.
	25	×	L 25.
	1.09	=	L 27.25
		M +	L 27.25
		C	L 0.
	32	×	L 32.
	42.5	=	L 1360.
		M +	L 1360.
		C	L 0.
	10	×	L 10.
	16.25	=	L 162.5
		M +	L 162.5
		RM	L 1555.6

Insignificant zeros not displayed: = \$1555.60

FORMULAS WITH CONSTANTS

Solve πr^2 for $r = 3$, $r = 4$, etc.		C CM	0.
(Store constant in memory)	3.1416	M +	L 3.1416
	3	×	L 3.
(= 3 ²)		=	L 9.
		×	L 9.
(Recalls π for multiplication)		RM	L 3.1416
(= 4 ²)		=	L 28.2744
	4	×	L 4.
		=	L 16.
		×	L 16.
		RM	L 3.1416
		=	L 50.2656

	ENTER	PRESS	DISPLAY
REDUCTION OF FRACTIONS			0.
72×9		C CM	0.
	3	\times	3.
3×6	6	$=$	18.
(Calculate denominator first)		M +	L 18.
	72	\times	L 72.
	9	$=$	L 648.
		\div	L 648.
		RM	L 18.
		$=$	L 36.

CUMULATIVE % TOTALS				0.
		C CM		0.
15% of 150	150	\times		150.
+ 10% of 200	15	%		22.5
+ 20% of 100		M +	L	22.5
<u> </u>	200	\times	L	200.
<u> </u>	10	%	L	20.
		M +	L	20.
	100	\times	L	100.
	20	%	L	20.
		M +	L	20.
		RM	L	62.5

	ENTER	PRESS	DISPLAY
CONSTANT DIVIDEND			0.
256	256	C CM	0.
64	8	M +	L 256.
		\div	L 256.
(Recalls memory)	64	$=$	L 4.
		RM	L 256.
		\div	L 256.
	8	$=$	L 32.
		RM	L 256.
		\div	L 256.
	32	$=$	L 8.

SHOPPING LIST				0.
		C CM		0.
0.99 taxable	.99	+		0.99
0.95 non-taxable	.95	M +	L	0.95
1.20 non-taxable				
1.41 taxable	1.2	M +	L	1.2
Total + tax = ?				
	1.41	+	L	2.4
(5% sales tax)	5	%	L	0.12
(With tax added)		$=$	L	2.52
		+	L	2.52
(Recalls non-taxable sum)		RM	L	2.15
Total		$=$	L	4.67

ENTER PRESS DISPLAY

ACCUMULATED

CONSTANTS

20% of 150	150	×	C CM	0.
20% of 200	20	%		150.
20% of 300		M +	L	30.
=	200	=	L	30.
		M +	L	40.
	200	=	L	40.
		M +	L	60.
	300	=	L	60.
		M +	L	60.
		RM	L	130.

HOMEWORK:

Prove solution of:

$\frac{4x+3}{6} - \frac{x-9}{4} = 5$	4	×	C CM	0.
	5.4	+		4.
for x = 5.4	3	÷		21.6
	6	=		24.6
		M +	L	4.1
$\frac{4(5.4)+3}{6} - \frac{5.4-9}{4}$	5.4	-	L	4.1
	9	÷	L	5.4
	4	=	L	-3.6
		M -	L	-0.9
(Answer has correct sign)		RM	L	-0.9
				5.

ENTER PRESS DISPLAY

METRIC CONVERSIONS:

INCHES OR MM

Store constant .03937 (= 1mm)

in memory			C CM	0.
	.03937	M +	L	0.03937
Convert 250 mm to inches	250	×	L	250.
(in. = 0.03937 × mm)		RM	L	0.03937
		=	L	9.8425
Convert 16 in. to mm	16	÷	L	16.
(mm = in. ÷ 0.03937)		RM	L	0.03937
		=	L	406.40081
Convert result to cm		÷	L	406.40081
(cm = mm ÷ 10)	10	=	L	40.640081
Convert new result		÷	L	406.40081
to meters				
(m = cm ÷ 100)	100	=	L	0.4064008

FEET OR CM

Store the constant

30.48 (1 foot) in memory	30.48	M +	L	0.
				30.48
2½ foot = ? cm	2.5	×	L	2.5
(cm = 30.48 × ft.)		RM	L	30.48
		=	L	76.2†
80 cm = ? Feet	80	÷	L	80.
(ft. = cm ÷ 30.48)		RM	L	30.48
		=	L	2.6246719

† If desired to convert to meters @ this stage divide by 1000

	ENTER	PRESS	DISPLAY
CONVERSION: OZ or GRAM			
Store constant 28.349			
(= 1 oz.) in memory		C CM	0.
	28.349	M +	L 28.349
Convert 100 g. to oz.	100	÷	L 100.
(oz. = g. ÷ 28.349)		RM	L 28.349
		=	L 3.5274612
	16	×	L 16.
Convert 16 oz. to grams		RM	L 28.349
(g = oz. × 28.349)		=	L 453.584

TEMPERATURE CONVERSION, °C or °F

For simple conversion of °C to °F or the reverse, store the constant 1.8 in the memory.			
	1.8	C CM	0.
		M +	L 1.8
		×	L 1.8
°C to °F: Multiply °C by	25	+	L 45.
constant and add 32.	32	=	L 77.
25°C = ?°F			
(°F = 1.8 × °C + 32)			
		C	L 0†
°F to °C: Subtract 32 from	68	—	L 68.
°F and divide by 1.8 (stored	32	÷	L 36.
constant)		RM	L 1.8
68°F = ? °C		=	L 20.
(°C = °F - 32 ÷ 1.8)			

†Assumes 1.8 is stored in memory

MAINTAINING CALCULATOR

Cleaning: Case may be cleaned with alcohol. Display window may be cleaned with glass cleaner.

Storage: Unit should not be exposed for any prolonged period to temperatures below -40°F or above 150°F (these temperatures might be encountered in a closed automobile, for example).

TROUBLE SHOOTING

If a problem occurs, verify that the power switch is "ON" (slide switch pushed toward AC Adaptor connection, See Page 3.)

Symptom	Power Source	Remedy
No Display	Battery	Recharge battery
Weak Display	Battery	Recharge battery
No Display	AC	Check that AC/DC adaptor is plugged into a proper outlet
Display Lit But Result Incorrect	Either	Review operating instructions

If the remedies suggested do not cure the problem, refer to your service certificate for instructions.

POWER

Your calculator is powered by rechargeable nickel-cadmium batteries and the following precautions should be followed:

- (1) Never operate unit more than 12 hours without recharging. (If unit is operated for longer periods, battery life may be reduced).
- (2) Recharge batteries for 12 hours, using charger supplied with unit.
 - (a) Turn calculator to OFF position
 - (b) Plug charger cord into calculator and the charger into any convenient AC outlet

NOTE: The unit can be operated while the adapter is "plugged in" to an AC outlet, but this will disconnect the charging circuit and charging will not occur during calculator operation. The unit is protected against accidental overcharge of batteries.

(3) Nickel-Cadmium Battery Replacement

Replacement should be performed only by an authorized service center. (See Service Certificate.)

NOTES:

SERVICE CERTIFICATE

Your electronic calculator is a precision electronic instrument which will serve you for many years with normal care.

CORVUS CORPORATION guarantees this calculator against defects in materials or workmanship for a period of one year from date of purchase. This guarantee applies only to the original owner registered on the card attached. This card must be completed and mailed, postage paid, within ten (10) days from date of purchase. Any merchandise that has been repaired by an unauthorized party, tampered with, or abused is not covered by this guarantee.

After one year from date of purchase CORVUS CORPORATION will repair any unit for the minimum service charge of Nine Dollars (\$9.00). Any unit requiring repair after this one year period should be returned, postage prepaid, with a check or money order for Nine Dollars (\$9.00) to the nearest service center. Once the problem is repaired the owner will be invoiced for the balance due, if any.

All merchandise must be returned, prepaid and fully insured, in the original packaging container or in a similarly-constructed container, via U.P.S. where possible. Enclose a letter explaining the problem, with place and date of purchase.

All defective units should be returned to the nearest service center. Corvus Corporation/13030 Branch View Lane/Dallas, Texas 75234

MODEL NO. _____

DATE OF PURCHASE _____

DEALER'S NAME _____

SERIAL NO. _____